USGS
science for a changing world

USGS Streamgaging in Montana– A Network Overview

John Kilpatrick, Director
Wyoming-Montana Water Science Center
U.S. Geological Survey

Prepared for *Water Policy Interim Committee* meeting,
Bozeman, Montana – May 21 - 22, 2018

U.S. Department of the Interior
U.S. Geological Survey

A Network Overview

Outline

Streamgage locations

- **Where are USGS streamgages located?**
- **Why are USGS streamgages located where they are?**

Streamgage funding

- **How is USGS streamgaging funded?**
- **Who funds USGS streamgaging?**

Streamgage costs

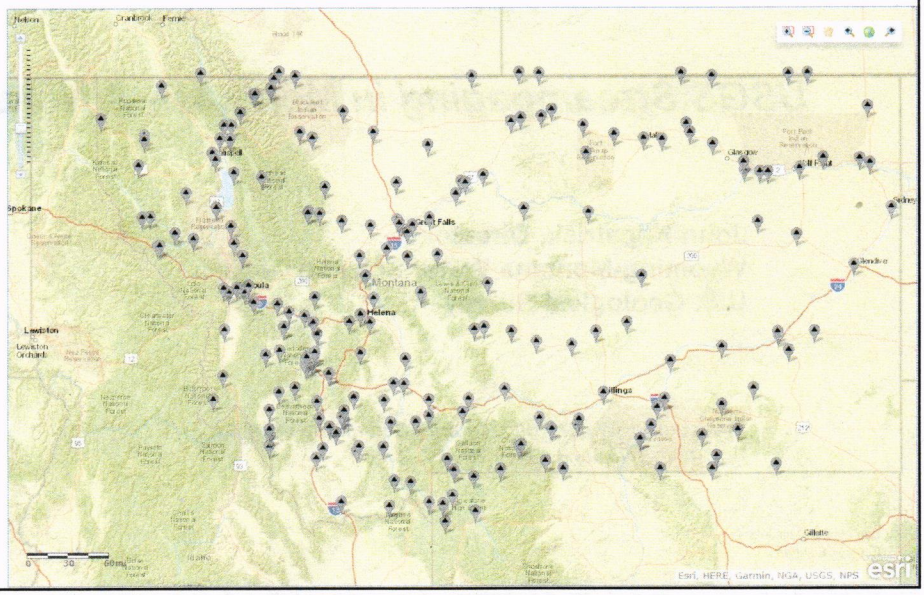
- **How much does a USGS streamgage cost?**
- **Why does a USGS streamgage cost so much?**

USGS

A Network Overview
Streamgage locations

Where are USGS streamgages located?

- 227 total streamgages operated and maintained by USGS
- Statewide including a few outside the State (e.g. Yellowstone)



USGS

A Network Overview
Streamgage locations (continued)

Why are USGS streamgages located where they are?

1. ***To characterize the Nation's water resources;***
2. To address the objectives of our funding partner; and
3. To provide high-quality streamflow data

USGS streamgaging characterizes the Nation's water resources by providing for:

- unbiased streamflow data at interstate **compact** and international treaty sites;
- near real-time streamflow data at flood and other **forecasting** points;
- streamflow **accounting** for resource management at major river basin outflows;
- monitoring streamflow in **sentinel** watersheds with little anthropogenic influence; and
- streamflow data needed at **water-quality** monitoring locations.

USGS

A Network Overview
Streamgage locations (continued)

Why are USGS streamgages located where they are?

1. To characterize the Nation's water resources;
2. ***To address the objectives of our funding partner; and***
3. To provide high-quality streamflow data

USGS streamflow data address the objectives of our funding partner by facilitating:

- **water-rights** administration;
- **reservoir** storage accounting;
- water-quality and **ecological** needs;
- **power-generation** requirements; and
- **water-resources** characterization.

USGS

A Network Overview
Streamgage locations (continued)

Why are USGS streamgages located where they are?

1. To characterize the Nation's water resources;
2. To address the objectives of our funding partner; and
3. ***To provide timely, high-quality streamflow data***

USGS provides timely, high-quality streamflow data by locating streamgages where:

- **stage** can be sensed accurately over the range of discharge;
- **discharge** can be measured accurately over the range of stage;
- an accurate stage-discharge **rating** can be defined and maintained;
- the channel in the reach and the control at the site is relatively **stable**; and
- long-term and year-round site **accessibility** is assured.

USGS

A Network Overview
Streamgage funding

How is USGS streamgaging funded?

Joint Funding Agreements

- Local Governments, Tribal Governments, and State Agencies
- U.S. Geological Survey Cooperative Matching Funds (USGS-CMF)

Interagency Agreements

- Other Federal Agencies

Direct Appropriation to USGS

- U.S. Geological Survey Federal Priority Streamgages (USGS-FPS)

Other agreements

- Federal Energy Regulatory Commission (FERC) licensees
- Collaborative agreements with watershed groups

USGS

A Network Overview
Streamgage funding (continued)

Who funds USGS streamgaging?

Local Government

- Conservation Districts; Irrigation Districts; Municipal Governments

State Agencies

- Montana: Bureau of Mines and Geology; Fish, Wildlife & Parks; Department of Justice – Natural Resources Damage Program; Department of Natural Resources and Conservation; Department of Transportation
- Wyoming: State Engineer's Office

Tribal Governments

- Confederated Salish and Kootenai Tribes, Fort Peck Assiniboine and Sioux Tribes, Northern Cheyenne Tribe

USGS

A Network Overview
Streamgage funding (continued)

Who funds USGS streamgaging? (continued)

Private Companies and NGOs

- **FERC Licensees - Avista Corporation; Energy Keepers, Inc.; NorthWestern Energy; Talen Energy; Tiber Montana, LLC**
- **NGOs – Tongue River Water Users Association**

Other Federal Agencies (OFA)

- **International Joint Commission; U.S. Army Corps of Engineers; U.S. Bureau of Land Management; U.S. Bureau of Reclamation; U.S. Department of Energy – Bonneville Power Administration (BPA); U.S. Environmental Protection Agency; U.S. Fish and Wildlife Service; U.S. National Park Service**

U.S. Geological Survey – Groundwater and Streamflow Information Program (GWSIP)

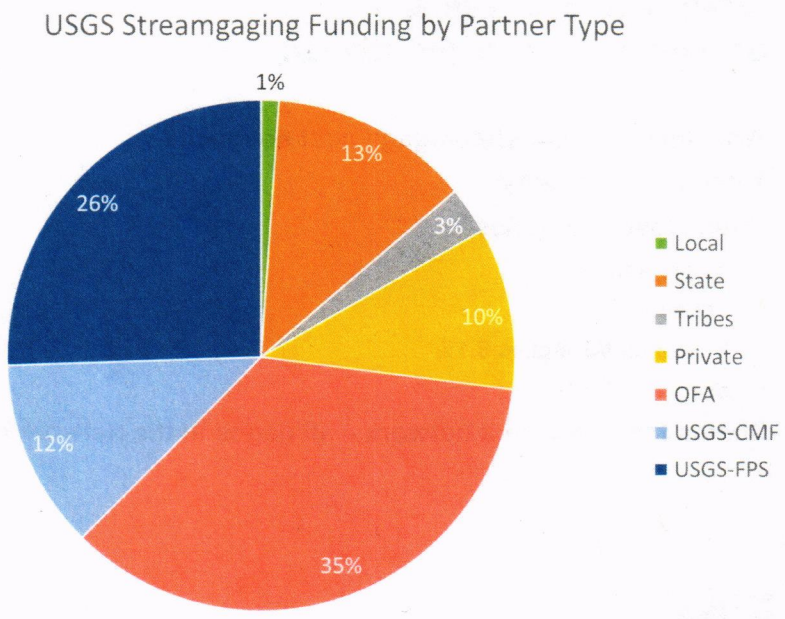
- **Cooperative Matching Funds (CMF); Federal Priority Streamgages (FPS)**

USGS

A Network Overview
Streamgage funding (continued)

Who funds USGS streamgaging? (continued)

- **~1/3 Local, State, Tribes, and Private**
- **~1/3 Other Federal Agencies**
- **~1/3 U.S. Geological Survey**



USGS

A Network Overview
Streamgage costs

How much does a USGS streamgage cost?

Function of period of operation

- Total cost: $18,080 → Year-round
- Total cost: $12,300 → Seasonal (7-month example)

Function of funding source

- U.S. Geological Survey Cooperative Matching Funds can offset up to 50% of total costs
- Availability of USGS-CMF subject to:
  - source of reimbursable funding (i.e. who is the funding partner)
  - appropriation (by Congress to USGS)
  - allocation (to our Center)
  - other programs (in our Center)

USGS

A Network Overview
Streamgage costs (continued)

Why does a USGS streamgage cost so much?

Total Cost Recovery

Major Cost Categories

- Salary 44.0%
- Travel 9.1%
- Equipment/Supplies 8.1%
- Support 38.8%

Cost is for a gage in a network – all gages in the network cost the same

USGS